**PROPOSED**

**COVERED SOURCE PERMIT (CSP) REVIEW - 0540-01-C (NEW)**
Application No. 0540-01

**Facility**: Jas. W. Glover, Ltd.
Located at 248 Sand Island Access Road, Oahu
UTM Coordinates 615,119 E / 2,358,802 N (NAD 83)

**Applicant**: Jas. W. Glover, Ltd.

**Responsible Official:** Mr. John Romanowski
Vice President
(808) 591-8977

**Mailing Address:** Jas. W. Glover, Ltd.
P.O. Box 579
Honolulu, HI 96809

**Equipment**: 300 TPH CMI Asphalt Plant with 1,085 HP Cummins diesel engine generator
CMI Drum-Mixer, Model PTD-300, with ESII 100 Burner
Baghouse servicing Drum-Mixer
20 gal/hr Hot Oil Heater, Model CEI-2000
Aggregate Bins
20 Ton Capacity Reclaimed Asphalt Paving (RAP) Bin with Rollers (Crusher) for Aggregate Sizing, Model PRB-120
4' x 10' Scalping Screen
Asphalt Storage Silo
Various Conveyor Belts

**Background:**

The applicant submitted their initial application for a new covered source on June 13, 2003, for the operation of an asphalt plant. The application filing fee of $1,000.00 was also received with the initial permit application. Revisions to the application, corrections to calculations, air quality modeling and additional information were submitted as follows:

July 21 - corrected pages of S-1 and S-2 to exclude “temporary” source references.
October 30 - calculations for HAPs from waste oil firing in drum mixer, HAPs from truck loadout and silo filling, HAPs from hot oil heater; revised $SO_2$ modeling files for drum mixer firing waste oil; updated *Emissions Units Table*.
November 21 - corrections to calculations submitted October 30; calculations for PM, TOC, and CO from silo filling and truck loadout.
November 28 - calculations for fugitive emissions from traffic on paved roads; corrections to hot oil heater emissions; revised calculations for aggregate handling.
December 4 - air modeling for drum mixer firing used oil; explanation for use of “urban” option in air modeling; information on stack parameters.
December 5 - emission calculations for RAP processing.

December 8 - proposal to raise diesel engine stack height to 21.5 feet; request sulfur content of spec used oil to be limited to 2.0% instead of 0.5%
December 9 - revised table summarizing air modeling results from raising the diesel engine generator stack

The proposed limits for the facility are 2,142,000 gal/yr (F.O. # 2 and spec oil), 159,000 gal/yr (F.O. # 2), and 60,000 gal/yr (F.O. # 2) for the drum mixer, diesel engine generator, and hot oil heater, respectively. The fuel limits can also represent 3,000 hours of operation of the drum mixer. That is, the maximum fuel flow rate of each combustion emission source multiplied by 3,000 hours operation limit of the drum mixer is equivalent to the fuel limit proposals. The applicant chose the fuel restrictions instead of the operational hour limit. The limits were proposed to meet the $NO_2$ annual average state ambient air quality standards (SAAQS).

**Applicable Requirements**:

Hawaii Administrative Rules (HAR)
- Title 11, Chapter 59, ambient Air Quality Standards
- Title 11, Chapter 60, Air Pollution Control
  - Subchapter 1 - General Requirements
  - Subchapter 2 - General Prohibitions
    - 11-60.1.31 Applicability
    - 11-60.1.32 Visible Emissions
    - 11-60.1.33 Fugitive Emissions
    - 11-60.1.37 Process Industries
    - 11-60.1-38 Sulfur Oxides from Fuel Combustion
  - Subchapter 5 - Covered Sources
  - Subchapter 6 - Fees for Covered Sources, Noncovered Sources, and Agriculture Burning
    - 11-60.1.111 Definition
    - 11-60.1.112 General Fee Provisions for Covered Sources
    - 11-60.1.113 Application Fees for Covered Sources
    - 11-60.1.114 Annual Fees for Covered Sources
  - Subchapter 8, Standards of Performance for Stationary Sources
    - 11-60.1-161(9) Standards of Performance for Asphalt Concrete Plants
    - 11-60.1-161(27) Standards of Perfomance for Nonmetallic Mineral Processing Plants
  - Subchapter 10 - Field Citations

<u>New Source Performance Standards (NSPS), 40 CFR, Part 60</u>:
Subpart A - General Provisions
Subpart I - Standards of Performance for Hot Mix Asphalt Facilities
Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants

<u>Compliance Data System (CDS)</u>:
Facility is a covered source. The facility will be included in an inventory system for annual inspection.

Best Available Control Technology (BACT):
BACT analysis is required for new covered sources and significant modifications to covered sources that have the potential to emit or increase emissions above significant levels, as defined in HAR 11-60.1-1, considering any limitations, enforceable by the Director, on the covered source to emit a pollutant. BACT determination includes all fugitive emissions (except for vehicle traffic emissions, which is included if the definition of "major" requires the consideration of fugitives in calculating potential emissions for major source determination). For this facility, NSPS (CAA Section 111) is applicable and therefore vehicle emissions (PM emissions from paved roads) are included per *11-60.1-1 Definitions* for a "major source" (AA). Table 1 shows the total facility emission with the significant level thesholds.

**Table 1 - Significant Level Trigger Levels**

| Pollutant | Facility Emissions, TPY | Significant Level, TPY |
|---|---|---|
| CO | 61.23 | 100 |
| $NO_x$ (as $NO_2$) | 47.96 | 40 |
| $SO_2$ | 33.85 | 40 |
| TSP | 28.76 | 25 |
| $PM_{10}$ | 17.42 | 15 |
| VOC | 22.31 | 40 |
| Pb | 6.79 E-03 | 0.6 |

$NO_x$, TSP and $PM_{10}$ exceed respective significant levels. The method of emission control for these pollutants are as follows:

For TPS/$PM_{10}$: Use of low sulfur diesel fuel (e.g., fuel oil no. 2) with low ash content and proper maintenance/operation of the diesel engine, hot oil heater and drum mix.

Baghouse for the drum mix

Water spray / truck for fugitive emissions from RAP bin and scalping screen

For $NO_x$ Proper maintenance/operation of the burners for the drum mix and hot oil heater.

Turbocharging and aftercooling , and proper maintenance/operation of the diesel engine

Synthetic Minor:
Emissions with controls equal to or greater than 100 TPY and reduced by operating restrictions (i.e., hour limit) to below 100 TPY would trigger synthetic minor status. The facility is determined to be a synthetic minor based on potential emissions greater than 100 TPY (i.e., $NO_x$) with emissions less than 100 TPY as limited by the proposed fuel restrictions. Only emissions from point sources, not fugitive sources, would determine applicability.

**Non-applicable Requirements:**

Consolidated Emissions Reporting Rule (CERR):
40 CFR Part 51, Subpart A - Emissions Inventory Reporting Requirements, determines CER based on facility-wide emissions of each air pollutant at the CER triggering level(s). As shown in Table 2, CER is not applicable.

However, The Clean Air Branch requests annual emissions reporting from those facilities that have *facility-wide* (e.g., total of all emission points) emissions of a single criteria pollutant exceeding the "in-house" triggering level. $NO_x$, $SO_x$, or $PM_{10}$ trigger in-house reporting of annual emissions.

**Table 2 - CERR/In-house Triggering Levels**

| Pollutant | Facility Emissions, TPY | CER Triggering Levels, TPY | In-House Triggering Levels, TPY |
|---|---|---|---|
| $NO_x$ | 47.96 | 100 | 25 |
| $SO_x$ | 33.85 | 100 | 25 |
| CO | 61.23 | 1,000 | 250 |
| $PM_{10}$ | 17.42 | 100 | 25 |
| VOC | 22.31 | 100 | 25 |
| Pb | 6.79 E-03 | 5 | 5 |

Compliance Assurance Monitoring (CAM), 40 CFR 64:
The purpose of CAM is to provide reasonable assurance that compliance is being achieved with large emissions units that rely on air pollution control equipment to meet an emissions limit or standard. Pursuant to 40 Code of Federal Regulations, Part 64, for CAM to be applicable, the emissions unit must (1) be located at a major source; (2) be subject to an emissions limit or standard; (3) use a control device to achieve compliance; (4) have potential pre-control emissions that are 100% of the major source level; and (5) not otherwise be exempt from CAM. The facility does not meet all the requirements and thus, CAM is not applicable.

Prevention of Significant Deterioration (PSD):
Not a major stationary source (criteria air pollutant >= 100 for listed sources or >=250 TPY for all other sources).

National Emissions Standards for Hazardous Emission Pollutants (NESHAP):
Not a listed source under 40 CFR 61 or 63

Maximum Achievable Control Technology (MACT):
Total hazardous air pollutant (HAP) emissions are 5.51 TPY. Highest single HAP emission is 0.81TPY (formaldehyde) from the hot oil heater. The thresholds for "major" status and MACT applicability is 10 and 25 TPY for single and total HAP emissions, respectively.

**Insignificant Activities:**

| Basis for Insign. Activity | Description |
|---|---|
| HAR 11-60.1 - 82(f)(1) | 8,000 gallon diesel fuel tank for mixer drum |
| HAR 11-60.1 - 82(f)(1) | 8,000 gallon diesel fuel tank for diesel engine generator |
| HAR 11-60.1 - 82(f)(1) | 8,000 gallon spec used oil tank for mixer drum |

**Alternate Operating Scenarios:**
Applicant proposes a temporary replacement diesel engine generator of same size or smaller with equal or lesser emissions if the permitted generator warrants a removal for a determined period of time.

**Project Emissions:**

**Table 3 - 300 TPH Drum Mix Asphalt Plant (Criteria and Metal Emissions)**

| Pollutant | F.O. # 2 | | Specification (Spec) Used Oil | |
|---|---|---|---|---|
| | [a]Emission Factor, lb/ton | [b]Annual Emission, TPY | [a]Emission Factor, lb/ton | [b]Annual Emission, TPY |
| $NO_x$ (as $NO_2$) | 0.055 | [c]24.75 | 0.055 | 24.75 |
| CO | 0.13 | 58.50 | 0.13 | 58.50 |
| $SO_2$ | 0.011 | 4.95 | 0.058 | 26.10 |
| VOC | 0.032 | 14.40 | 0.032 | 14.40 |
| $PM_{10}$ | [d,e]0.023 | 10.35 | [d,e]0.023 | 10.35 |
| TSP | [d,e]0.033 | 14.85 | [d,e]0.033 | 14.85 |
| Metal Emissions (HAPs) | | | | |
| Arsenic | 5.6 E-07 | 2.52 E-04 | SAME AS F.O. #2 | |
| Beryllium | 0.0 | 0.0 | | |
| Cadmium | 4.1 E-07 | 1.85 E-04 | | |
| Chromium | 5.5 E-06 | 2.48 E-03 | | |
| Cobalt | 2.6 E-08 | 1.17 E-05 | | |
| Chromium (+6) | 4.5 E-07 | 2.03 E-04 | | |
| Lead | 1.5 E-05 | 6.75 E-03 | | |
| Manganese | 7.7 E-06 | 3.47 E-03 | | |
| Mercury | 2.6 E-06 | 1.17 E-03 | | |
| Nickel | 6.3 E-05 | 2.84 E-02 | | |
| Phosphorus | 2.8 E-05 | 1.26 E-02 | | |
| Selenium | 3.5 E-07 | 1.58 E-04 | | |
| | | Total 5.57 E-02 | | |

[a] AP-42, 12/00: Table 11.1-3 for $PM_{10}$, TSP
Table 11.1-7 for CO, $NO_x$, $SO_2$
Table 11.1-8 for VOC

[b] 3,000 hr/yr operational limit

[c] (300 ton/hr) x (0.055 lb/ton) x (ton/2000 lb) x (3,000 hr/yr) = 24.75 TPY

[d] Fabric filter, control efficiency incorporated in emission factor

[e] Footnote (g) of Table 11.1-3

## Table 4 - 300 TPH Drum Mix Asphalt Plant (HAPs from F.O. #2)

| Hazardous Air Pollutant | [a]Emission Factor, lb/ton | [b]Annual Emissions, TPY |
|---|---|---|
| NON-PAH | | |
| Benzene | 3.9 E-04 | 1.76 E-01 |
| Ethylbenzene | 2.4 E-04 | 1.08 E-01 |
| Formaldehyde | 3.1 E-03 | 1.40 |
| Hexane | 9.2 E-04 | 4.14 E-01 |
| Iso-octane | 4.0 E-05 | 1.80 E-02 |
| Methyl chloroform | 4.8 E-05 | 2.16 E-02 |
| Toluene | 2.9 E-03 | 1.31 |
| Xylene | 2.0 E-04 | 9.00 E-02 |
| PAH | | |
| 2-Methylnaphthalene | 1.7 E-04 | 7.65 E-02 |
| Acenaphthene | 1.4 E-06 | 6.30 E-04 |
| Acenaphthylene | 2.2 E-05 | 9.90 E-03 |
| Anthracene | 3.1 E-06 | 1.40 E-03 |
| Benzo(a)anthracene | 2.1 E-07 | 9.45 E-05 |
| Benzo(a)pyrene | 9.8 E-09 | 4.41 E-06 |
| Benzo(b)fluoranthene | 1.0 E-07 | 4.50 E-05 |
| Benzo(e)pyrene | 1.1 E-07 | 4.95 E-05 |
| Benzo(g,h,i)perylene | 4.0 E-08 | 1.80 E-05 |
| Benzo(f)fluroranthene | 4.1 E-08 | 1.85 E-05 |
| Chrysene | 1.8 E-07 | 8.10 E-05 |
| Fluorathene | 6.1 E-07 | 2.75 E-04 |
| Fluorene | 1.1 E-05 | 4.95 E-03 |
| Indeno(1,2,3-cd)pyrene | 7.0 E-09 | 3.15 E-06 |
| Napthalene | 6.5 E-04 | 2.93 E-01 |
| Perylene | 8.8 E-09 | 3.96 E-06 |
| Phenanthrene | 2.3 E-05 | 1.04 E-02 |
| Pyrene | 3.0 E-06 | 1.35 E-03 |
| Total HAPs | 8.7 E-03 | 3.92 |

[a] AP-42, Table 11.1-10 (12/00)
[b] 3,000 hr/yr operating limit

## Table 5 - 300 TPH Drum Mix Asphalt Plant (HAPs from Spec Oil)

| Hazardous Air Pollutant | [a]Emission Factor, lb/ton | [b]Annual Emissions, TPY |
|---|---|---|
| NON-PAH | | |
| Acetaldehyde | 1.3 E-03 | 5.85 E-01 |
| Acrolein | 2.6 E-05 | 1.17 E-02 |
| Benzene | 3.9 E-04 | 1.76 E-01 |
| Ethylbenzene | 2.4 E-04 | 1.08 E-01 |
| Formaldehyde | 3.1 E-03 | 1.40 |
| Hexane | 9.2 E-04 | 4.14 E-01 |
| Iso-octane | 4.0 E-05 | 1.80 E-02 |
| Methyl Ethyl Ketone | 2.0 E-05 | 9.00 E-03 |
| Propionaldehyde | 1.3 E-04 | 5.85 E-02 |
| Quinone | 1.6 E-04 | 7.20 E-02 |
| Methyl Chloroform | 4.8 E-05 | 2.16 E-02 |
| Toluene | 2.9 E-03 | 1.31 |
| Xylene | 2.0 E-04 | 9.00 E-02 |
| PAH | | |
| 2-Methylnaphthalene | 1.7 E-04 | 7.65 E-02 |
| Acenaphthene | 1.4 E-06 | 6.30 E-04 |
| Acenaphthylene | 2.2 E-05 | 9.90 E-03 |
| Anthracene | 3.1 E-06 | 1.40 E-03 |
| Benzo(a)anthracene | 2.1 E-07 | 9.45 E-05 |
| Benzo(a)pyrene | 9.8 E-09 | 4.41 E-06 |
| Benzo(b)fluoranthene | 1.0 E-07 | 4.50 E-05 |
| Benzo(e)pyrene | 1.1 E-07 | 4.95 E-05 |
| Benzo(g,h,i)perylene | 4.0 E-08 | 1.80 E-05 |
| Benzo(k)fluoranthene | 4.1 E-08 | 1.85 E-05 |
| Chrysene | 1.8 E-07 | 8.10 E-05 |
| Fluoranthene | 6.1 E-07 | 2.75 E-04 |
| Fluorene | 1.1 E-05 | 4.95 E-03 |
| Indeno(1,2,3-cd)pyrene | 7.0 E-09 | 3.15 E-06 |
| Napthalene | 6.5 E-04 | 2.93 E-01 |

| | | |
|---|---|---|
| Perylene | 8.8 E-09 | 3.96 E-06 |
| Phenanthrene | 2.3 E-05 | 1.40 E-02 |
| Pyrene | 3.0 E-06 | 1.35 E-03 |
| Total HAPs (Non-PAH & PAH) | 0.0104 | 4.5 |

[a] AP-42, Table 11.1-10 (12/00)
[b] 3,000 hr/yr operating limit

### Table 6 - 300 TPH Drum Mix Asphalt Plant (Dioxin/Furan from Spec Oil)

| Pollutant | [a]Emission Factor, lb/ton | Annual Emissions, TPY |
|---|---|---|
| Dioxins | 7.9 E-11 | 3.56 E-08 |
| Furans | 4.0 E-11 | 1.80 E-08 |
| | Total | 5.36 E-08 |

[a] AP-42, Table 11.1-10 (12/00)

### Table 7 - Diesel Engine (Criteria)

| Pollutant | [a]Emission Factor, lb/MMBtu | Annual Emission (3,000 hr/yr), TPY |
|---|---|---|
| $SO_2$ | [b]0.505 | [c]5.62 |
| $NO_x$ (as $NO_2$) | 2.031 | 22.61 |
| CO | 0.129 | 1.44 |
| TSP | 0.032 | 0.36 |
| $PM_{10}$ | 0.032 | 0.36 |
| VOC | 0.048 | 0.53 |

[a] Manufacturer's Specs:
HC = 0.15 g/hp-hr x [1085 bhp/ (53 gal/hr)] x (gal/0.14 MMBtu) x (2.205 E-03 lb / g) = 0.048 lb/MMBtu
$NO_2$ = 6.30 g/hp-hr = 2.031
CO = 0.40 g/hp-hr = 0.129
TSP/$PM_{10}$ = 0.10 g/hp-hr = 0.032

[b] AP-42, Table 3.4-1 (10/96)
EF = 1.01s = 1.01x (0.5) = 0.505 lb/MMBtu

[c] (53 gal/hr) x (3,000 hr/yr) x (0.14 MMBtu/gal) x (0.505 lb/MMBtu) x (ton/2000 lb) = 5.62 TPY

## Table 8 - Diesel Engine (HAPs)

| Hazardous Air Pollutant | [a]Emission Factor, lb/MMBtu | Annual Emissions (3,000 hr/yr), TPY |
|---|---|---|
| Benzene | 7.76 E-04 | 8.64 E-03 |
| Toluene | 2.81 E-04 | 3.13 E-03 |
| Xylene | 1.93 E-04 | 2.15 E-03 |
| Propylene | 2.79 E-03 | 3.11 E-02 |
| Formaldehyde | 7.89 E-05 | 8.78 E-04 |
| Acetaldehyde | 2.52 E-05 | 2.80 E-04 |
| Acrolein | 7.88 E-06 | 8.77 E-05 |

[a] AP-42, Table 3.4-3 (10/96) Total: 4.63 E-02

## Table 9 - Hot Oil heater (Criteria and Metal Emissions)

| Pollutant | [a]Emission Factor, lb/kgal | Annual Emissions, TPY (3,000 hr/yr) |
|---|---|---|
| $NO_x$ (as $NO_2$) | 20 | [b]0.60 |
| CO | 5 | 0.15 |
| $SO_2$ | 142s = 71 | 2.13 |
| VOC | 0.556 | 0.02 |
| $PM_{10}$ | 1.08 | 0.03 |
| TSP | 2 | 0.06 |
| Arsenic | [c]5.6 E-04 | 1.68 E-05 |
| Beryllium | 4.2 E-04 | 1.26 E-05 |
| Cadmium | 4.2 E-04 | 1.26 E-05 |
| Chromium | 4.2 E-04 | 1.26 E-05 |
| Lead | 1.3 E-03 | 3.90 E-05 |
| Mercury | 4.2 E-04 | 1.26 E-05 |
| Manganese | 8.4 E-04 | 2.52 E-05 |
| Nickel | 4.2 E-04 | 1.26 E-05 |
| Selenium | 2.1 E-03 | 6.30 E-05 |

[a] AP-42 has no criteria pollutant specific factors for hot oil heaters. “Commercial” boiler (0.5 to 10 MMBtu/hr) is instead used to evaluate emissions:

AP-42, Table 1.3-1 for $NO_x$, CO, $SO_2$, and TSP
Table 1.3-7 for $PM_{10}$
Table 1.3-3 for VOC
Table 1.3-10 for metal HAPs

[b] (20 gal/hr) x (20 lb/kgal) x (3,000 hr/yr) x (ton/ 2000 lb) = 0.6 TPY

[c] (4 lb/$10^{12}$ Btu) x (0.14 MMBtu/gal) = 0.56 lb/$10^3$ kgal = 5.6 E-04 lb/kgal

# PROPOSED

### Table 10 - Hot Oil Heater (HAPs and Dioxins/Furans)

| Hazardous Air Pollutant | [a]Emission Factor, lb/gal | Annual Emissions, TPY |
|---|---|---|
| Formaldehyde | 2.7 E-02 | [b]0.81 |
| Acenaphthene | 5.3 E-07 | 1.59 E-05 |
| Acenaphthylene | 2.0 E-07 | 6.00 E-06 |
| Anthracene | 1.8 E-07 | 5.40 E-06 |
| Benzo(b)fluoranthene | 1.0 E-07 | 3.00 E-06 |
| Fluoranthene | 4.4 E-08 | 1.32 E-06 |
| Fluorene | 3.2 E-08 | 9.60 E-07 |
| Napthalene | 1.7 E-05 | 5.10 E-04 |
| Phenanthrene | 4.9 E-06 | 1.47 E-04 |
| Pyrene | 3.2 E-08 | 9.60 E-07 |
| Dioxins | 2.0 E-10 | 6.00 E-09 |
| Furans | 3.1 E-11 | 9.30 E-10 |

[a] AP-42, Table 11.1-13 (12/00)
[b] (20 gal/hr) x (2.7 E-02) x (3,000 hr/yr) x (ton/2,000 lb) = 0.81 TPY

Vehicle Emissions (Paved Roads)
Quantification of fugitive emissions from paved roads is shown below. These emissions, however, will not be added to total emissions since the sources of emissions (i.e., litter, spills, biological debris, ice control compounds, etc.) that contribute to the basis of the emission factor will not likely occur. Adding the vehicle emissions from paved roads would unrealistically bias the total particulate emissions.

AP-42, Table 13.2-1.1 (10/02), Table 13.2.1-3, and Equation(2)

E, lb/VMT = $(k) \times (sL/2)^{0.65} \times (W/3)^{1.5} \times (1\text{-}P/4N)$

k = 0.016 lb/VMT for $PM_{10}$, k = 0.082 lb/VMT for TSP

sL = 76 $g/m^2$, note: mean appears to be rather high for Sand Island. As such, the lower end of the range is used.

W = [ (30,000 + 78,000) / 2 ] x ton/2000 lb = 27 tons, average of tare (before load) and gross weights (after loading)

P = number of “wet” days with at least 0.01 inches of precipitation during the averaging period = 95 (Honolulu Int’l Airport)

N = number of days in averaging period = 365

Trucks VMT/yr: 0.202 mi. (one-way)
truck load, (78,000 -30,000) lb x (ton/2000 lb) = 24 ton load
amount of asphalt concrete, 300 TPH x 3000 hr/yr = 900,000 ton/yr
no. of truck loads = no. of trips on road = 900,000 / 24 = 37,500 trips
trucks VMT/yr = (2 x 0.202) x (37,500) = 15,150 mi/yr

$PM_{10}$: E = $(0.016) \times (76/2)^{0.65} \times (27/3)^{1.5} \times 93\%$= 4.28 lb/VMT
(15,150 mi/yr) x (4.28 lb/VMT) x (ton / 2,000 lb) x (1-70%) = 9.71 ton/yr, water truck 70% control efficiency

TSP: E= 21.93 lb/VMT
(15,150 mi/yr) x (21.93) x (1 / 2,000) x (1-70%) = 49.84 ton/yr

Storage Piles

AP-42, Equation 1 (1/95), Table 11.12-2 footnote b for moisture content

E, lb/ton = $(k) \times (0.0032) \times [ (U/5)^{1.3} / (M/2)^{1.4} ]$ emission factor
aggregate storage pile: assume aggregate 95% of production weight, 5% asphalt
(300 ton/hr) x (3,000 hr/yr) x 0.95 = 855,000 TPY

$PM_{10}$: $E_{agg} = (0.35) \times (0.0032) \times [ (15/5)^{1.3} / (1.77/2)^{1.4} ]$ = 5.54 E-03 lb/ton
(5.54 E -03 lb/ton) x (855,000 ton/yr) x (ton/2000 lb) x (1-70%) = 0.71 TPY, water truck 70% control efficiency

TSP: k = 0.74, $E_{agg}$ = 1.17 E-02
(1.17 E-02) x (855,000) x (1 / 2000) x (1-70%) = 1.50 TPY

**Table 11 - Aggregate Handling**

| Process | [a]$PM_{10}$ Emission Factor, lb/ton | $PM_{10}$ Emissions, TPY | [a]TSP Emission Factor, lb/ton | [b]TSP Emissions, TPY |
|---|---|---|---|---|
| Truck unloading to storage bin | 1.6 E-05 | [c]0.007 | 3.36 E-05 | 0.014 |
| Storage bin to conveyor | 1.4 E-03 | 0.599 | 2.94 E-03 | 1.257 |
| Conveyor to Scalping Screen | 1.4 E-03 | 0.599 | 2.94 E-03 | 1.257 |
| Scalping Screen | 1.5 E-02 | [d]1.924 | 3.15 E-02 | [d]4.040 |
| Scalping Screen to conveyor | 1.4 E-03 | 0.599 | 2.94 E-03 | 1.257 |
| Conveyor to Drum Hopper | 1.4 E-03 | 0.599 | 2.94 E-03 | 1.257 |
| | Total | 4.33 | Total | 9.08 |

[a] AP-42, Table 11.19.2-2 (1/95)
[b] TSP = $PM_{10}$ (2.1)
[c] assume aggregate 95% of production weight
(300 ton/hr) x (3,000 hr/yr) x (0.95) = 855,000 ton/yr
(855,000 ton/yr) x (1.6 E-05 lb/ton) x (ton/2000 lb) = 0.007 TPY
[d] includes 70% control efficiency for water sprays

## Table 12 - Loadout

| Pollutant | [a]Emission Factor, lb/ton | Annual Emissions, TPY |
|---|---|---|
| Total PM | 5.22 E-04 | [b]0.23 |
| Organic PM (HAPs) | 3.41 E-04 | 0.15 |
| TOC | 4.16 E-03 | 1.87 |
| CO | 1.35 E-03 | 0.61 |

[a] AP-42, Table 11.1-14 (12/00)

V = - 0.5, T = 325° F default values per footnote a

$EF_{PM}$ = 0.000181 + 0.00141 (- V) e^ [ (0.0251) (T + 460) - 20.43] = 5.22 E-04 lb/ton

$EF_{Org\ PM}$ = 0.00141 (-V) e^ [ (0.0251) (T + 460) - 20.43] = 3.41 E-04

$EF_{TOC}$ = 0.0172 (- V) e^ [ (0.0251) (T + 460) - 20.43] = 4.16 E-03

$EF_{CO}$ = 0.00558 (-V) e^ [ (0.0251 )(T + 460) - 20.43] = 1.35 E-03

[b] (300 ton/hr) x (3,000 hr/yr) x (5.22 E-04 lb/ton) x (ton/2,000 lb) = 0.23 TPY

## Table 13 - Loadout (HAPs Speciation - Organic Particulate Based Compounds)

| HAP | [a]Speciation, % | [b]Emission Factor, lb/ton | Annual Emissions, TPY |
|---|---|---|---|
| PAH HAPs | | | |
| Acenaphthene | 0.26 | [c]8.87 E-07 | [d]3.99 E-04 |
| Acenaphthylene | 0.028 | 9.55 E-08 | 4.30 E-05 |
| Anthracene | 0.070 | 2.39 E-07 | 1.08 E-04 |
| Benzo(a)anthracene | 0.019 | 6.48 E-08 | 2.92 E-05 |
| Benzo(b)fluoranthene | 0.0076 | 2.59 E-08 | 1.17 E-05 |
| Benzo(k)fluoranthene | 0.0022 | 7.50 E-09 | 3.38 E-06 |
| Benzo(g,h,i)perylene | 0.0019 | 6.48 E-09 | 2.92 E-06 |
| Benzo(a)pyrene | 0.0023 | 7.84 E-09 | 3.53 E-06 |
| Benzo(e)pyrene | 0.0078 | 2.66 E-08 | 1.20 E-05 |
| Chrysene | 0.103 | 3.51 E-07 | 1.58 E-04 |
| Dibenz(a,h)anthracene | 0.00037 | 1.26 E-09 | 5.67 E-07 |
| Fluoranthene | 0.050 | 1.71 E-07 | 7.70 E-05 |
| Fluorene | 0.77 | 2.63 E-06 | 1.18 E-03 |
| Indeno(1,2,3-cd)pyrene | 0.00047 | 1.60 E-09 | 7.20 E-07 |
| 2-Methylnaphthalene | 2.38 | 8.12 E-06 | 3.65 E-03 |
| Naphthalene | 1.25 | 4.26 E-06 | 1.92 E-03 |
| Perylene | 0.022 | 7.50 E-08 | 3.38 E-05 |
| Phenanthrene | 0.81 | 2.76 E-06 | 1.24 E-03 |

| | | | |
|---|---|---|---|
| Pyrene | 0.15 | 5.12 E-07 | 2.30 E-04 |
| Total PAH HAPs | 5.93 | 2.02 E-05 | 9.09 E-03 |
| Other Semi-Volatile HAPs | | | |
| Phenol | 1.18 | 4.02 E-06 | 1.81 E-03 |

[a] AP-42, Table 11.1-15 (12/00)
[b] Determined by multiplying the speciation percent by the organic PM in Table 12
[c] (2.6 E-03) x (3.41 E-04) = 8.87 E-07
[d] (300 ton/hr) x (3,000 hr/yr) x (8.87 E-07) x (ton/2000 lb) = 3.99 E-04

## Table 14 - Loadout (HAPs Speciation -Organic Volatile Based Compounds)

| HAP | [a]Speciation, % | [b]Emission Factor, lb/ton | Annual Emissions, TPY |
|---|---|---|---|
| Benzene | 0.052 | [c]2.16 E-06 | [d]9.73 E-04 |
| Bromomethane | 0.0096 | 3.99 E-07 | 1.80 E-04 |
| 2-Butanone | 0.049 | 2.04 E-06 | 9.18 E-04 |
| Carbon Disulfide | 0.013 | 5.41 E-07 | 2.43 E-04 |
| Chloroethane | 0.00021 | 8.74 E-09 | 3.93 E-06 |
| Chloromethane | 0.015 | 6.24 E-07 | 2.81 E-04 |
| Cumene | 0.11 | 4.58 E-06 | 2.06 E-03 |
| Ethylbenzene | 0.28 | 1.16 E-05 | 5.22 E-03 |
| Formaldehyde | 0.088 | 3.66 E-06 | 1.65 E-03 |
| n-Hexane | 0.15 | 6.24 E-06 | 2.81 E-03 |
| Iso-octane | 0.0018 | 7.49 E-08 | 3.37 E-05 |
| Methylene Chloride | 0.0 | 0.0 | 0.0 |
| MTBE | 0.0 | 0.0 | 0.0 |
| Styrene | 0.0073 | 3.04 E-07 | 1.37 E-04 |
| Tetrachloroethene | 0.0077 | 3.20 E-07 | 1.44 E-04 |
| Toluene | 0.21 | 8.74 E-06 | 3.93 E-03 |
| 1,1,1-Trichloroethane | 0.0 | 0.0 | 0.0 |
| Trichloroethene | 0.0 | 0.0 | 0.0 |
| Trichlorofluoromethane | 0.0013 | 5.41 E-08 | 2.43 E-05 |
| m-/p-Xylene | 0.41 | 1.71 E-05 | 7.68 E-03 |
| o-Xylene | 0.08 | 3.33 E-06 | 1.50 E-03 |
| Total VOC HAPs | 1.5 | 6.24 E-05 | 2.81 E-02 |

[a] AP-42, Table 11.1-16 (12/00)
[b] Determined by multiplying the speciation percent by the TOC in Table 12
[c] (5.2 E-04) x (4.16 E-03) = 2.16 E-06
[d] (300 ton/hr) x (3,000 hr/yr) x (2.16 E-06) x (ton/2000 lb) = 9.73 E-04

## Table 15 - Silo Filling

| Pollutant | [a]Emission Factor, lb/ton | Annual Emissions, TPY |
|---|---|---|
| Total PM | 5.86 E-04 | [b]0.26 |
| Organic PM (HAPs) | 2.54 E-04 | 0.11 |
| TOC | 1.22 E-02 | 5.49 |
| CO | 1.18 E-03 | 0.53 |

[a] AP-42, Table 11.1-14 (12/00)
V = - 0.5, T = 325° F default values per footnote a
$EF_{PM}$ = 0.000332 + 0.00105 (- V) e^ [ (0.0251) (T + 460) - 20.43] = 5.86 E-04 lb/ton
$EF_{Org\ PM}$ = 0.00105 (-V) e^ [ (0.0251) (T + 460) - 20.43] = 2.54 E-04
$EF_{TOC}$ = 0.0504 ( -V) e^ [ (0.0251) (T + 460) - 20.43] = 1.22 E-02
$EF_{CO}$ = 0.00488 ( -V) e^ [ (0.0251) (T + 460) - 20.43] = 1.18 E-03
[b] (300 ton/hr) x (3,000 hr/yr) x (5.86 E-04 lb/ton) x (ton/2,000 lb) = 0.26 TPY

## Table 16 - Silo Filling (HAPs Speciation - Organic Particulate Based Compounds)

| HAP | [a]Speciation, % | [b]Emission Factor, lb/ton | Annual Emissions, TPY |
|---|---|---|---|
| PAH HAPs | | | |
| Acenaphthene | 0.47 | [c]1.19 E-06 | [d]5.36 E-04 |
| Acenaphthylene | 0.014 | 3.56 E-08 | 1.60 E-05 |
| Anthracene | 0.13 | 3.30 E-07 | 1.49 E-04 |
| Benzo(a)anthracene | 0.056 | 1.42 E-07 | 6.39 E-05 |
| Benzo(b)fluoranthene | ND | ---- | ---- |
| Benzo(k)fluoranthene | ND | ---- | ---- |
| Benzo(g,h,i)perylene | ND | ---- | ---- |
| Benzo(a)pyrene | ND | ---- | ---- |
| Benzo(e)pyrene | 0.0095 | 2.41 E-08 | 1.08 E-05 |
| Chrysene | 0.21 | 5.33 E-07 | 2.40 E-04 |
| Dibenz(a,h)anthracene | ND | ---- | ---- |
| Fluoranthene | 0.15 | 3.81 E-07 | 1.71 E-04 |
| Fluorene | 1.01 | 2.57 E-06 | 1.16 E-03 |
| Indeno(1,2,3-cd)pyrene | ND | ---- | ---- |
| 2-Methylnaphthalene | 5.27 | 1.34 E-05 | 6.03 E-03 |
| Naphthalene | 1.82 | 4.62 E-06 | 2.08 E-03 |
| Perylene | 0.030 | 7.62 E-08 | 3.43 E-05 |
| Phenanthrene | 1.80 | 4.57 E-06 | 2.06 E-03 |
| Pyrene | 0.44 | 1.12 E-06 | 5.04 E-04 |

| | | | |
|---|---|---|---|
| Total PAH HAPs | 11.40 | 2.90 E-05 | 1.31 E-02 |
| Other Semi-Volatile HAPs | | | |
| Phenol | ND | ---- | ---- |

[a] AP-42, Table 11.1-15 (12/00)
[b] Determined by multiplying the speciation percent by the organic PM in Table 15
[c] (4.7 E-03) x (2.54 E-04) = 1.19 E-06
[d] (300 ton/hr) x (3,000 hr/yr) x (1.19 E-06) x (ton/2000 lb) = 5.36 E-04

### Table 17 - Silo Filling (HAPs Speciation - Organic Volatile Based Compounds)

| HAP | [a]Speciation, % | [b]Emission Factor, lb/ton | Annual Emission, TPY |
|---|---|---|---|
| Benzene | 0.032 | [c]3.90 E-06 | [d]1.76 E-03 |
| Bromomethane | 0.0049 | 5.98 E-07 | 2.69 E-04 |
| 2-Butanone | 0.039 | 4.76 E-06 | 2.14 E-03 |
| Carbon Disulfide | 0.016 | 1.95 E-06 | 8.78 E-04 |
| Chloroethane | 0.004 | 4.88 E-07 | 2.20 E-04 |
| Chloromethane | 0.023 | 2.81 E-06 | 1.26 E-03 |
| Cumene | non-detect | 0.0 | 0.0 |
| Ethylbenzene | 0.038 | 4.64 E-06 | 2.09 E-03 |
| Formaldehyde | 0.69 | 8.42 E-05 | 3.79 E-02 |
| n-Hexane | 0.10 | 1.22 E-05 | 5.49 E-03 |
| Iso-octane | 0.00031 | 3.78 E-08 | 1.70 E-05 |
| Methylene Chloride | 0.00027 | 3.29 E-08 | 1.48 E-05 |
| MTBE | ND | 0.0 | 0.0 |
| Styrene | 0.0054 | 6.59 E-07 | 2.97 E-04 |
| Tetrachloroethene | ND | 0.0 | 0.0 |
| Toluene | 0.062 | 7.56 E-06 | 3.40 E-03 |
| 1,1,1-Trichloroethane | ND | 0.0 | 0.0 |
| Trichloroethene | ND | 0.0 | 0.0 |
| Trichlorofluoromethane | ND | 0.0 | 0.0 |
| m-/p-Xylene | 0.2 | 2.44 E-05 | 1.10 E-02 |
| o-Xylene | 0.057 | 6.95 E-06 | 3.13 E-03 |
| Total VOC HAPs | 1.3 | 1.59 E-04 | 7.16 E-02 |

[a] AP-42, Table 11.1-16 (12/00)
[b] Determined by multiplying the speciation percent by the TOC in Table 15
[c] (3.2 E-04) x (1.22 E-02) = 3.90 E-06
[d] (300 ton/hr) x (3,000 hr/yr) x (3.90 E-06) x (ton/2,000 lb) = 1.76 E-03

**PROPOSED**

**Table 18 - RAP Bin**

| Process | [a]$PM_{10}$ Emission Factor, lb/ton | Emissions, TPY | [a,b]TSP Emission Factor, lb/ton | Emissions TPY |
|---|---|---|---|---|
| Unload to Feeder | 1.6 E-05 | [c]7.2 E-03 | 3.36 E-05 | 1.51 E-02 |
| Roll Crusher | 0.0024 | [d]0.32 | 0.005 | [d]0.68 |
| Roll Crusher to Conveyor | 0.0014 | [e]0.41 | 2.94 E-03 | [e]0.86 |
| Conveyor to Drum Mixer | 0.0014 | [e]0.41 | 2.94 E-03 | [e]0.86 |

[a] AP-42, Table 11.19.2-2 (1/95) Total: 1.15 Total: 2.42

[b] TSP = 2.1 x $PM_{10}$

[c] (300 ton/hr) x (3,000 hr/yr) x (1.6 E-05 lb/ton) x (ton/2,000 lb) =7.2 E-03

[d] water spray 70% control efficiency

[e] material damp 35% control efficiency (½ control efficiency of 70% for moisture carry over from water spray)

**Table 19 - [a]Facility Emissions Summary (Criteria)**

| Pollutant | Drum Mix | Diesel Engine | Hot Oil Heater | Load-out | Silo Filling | Aggregate Handling | Storage Piles | RAP Bin | Total |
|---|---|---|---|---|---|---|---|---|---|
| CO | 58.50 | 1.44 | 0.15 | 0.61 | 0.53 | -- | -- | -- | 61.23 |
| $NO_x$ | 24.75 | 22.61 | 0.60 | -- | -- | -- | -- | -- | 47.96 |
| $SO_2$ | 26.10 | 5.62 | 2.13 | -- | -- | -- | -- | -- | 33.85 |
| TSP | 14.85 | 0.36 | 0.06 | 0.23 | 0.26 | 9.08 | 1.50 | 2.42 | 28.76 |
| $PM_{10}$ | 10.35 | 0.36 | 0.03 | 0.23 | 0.26 | 4.33 | 0.71 | 1.15 | 17.42 |
| VOC | 14.40 | 0.53 | 0.02 | 1.87 | 5.49 | -- | -- | -- | 22.31 |
| Pb | 6.75E-03 | -- | 3.90 E-05 | -- | -- | -- | -- | -- | 6.79E-03 |

[a] Emissions in TPY

**PROPOSED**

**Table 20 - [a]Facillity Emissions Summary (HAPs)**

| Drum Mix | Diesel Engine | Hot Oil Heater | Loadout | Silo Filling | Total |
|---|---|---|---|---|---|
| 4.5 (non-PAH and PAH)<br>5.57 E-02 (Metal HAPs) | 4.63 E-02 | 8.11 E-01<br>2.07 E-04 (Metal HAPs) | 2.81 E-02 (VOC HAPs)<br>9.09 E-03 (PAH HAPs)<br>1.81 E-03 (Semi Volatile HAPs) | 7.16 E-02 (VOC HAPs)<br>1.31 E-02 (PAH HAPs) | 5.54 |

[a] Emissions in TPY

**Air Quality Assessment:**

ISCST3 modeling was used to predict maximum concentrations. The modeling utilized 5 years (1990, '91, '93, '94, and '95) of meteorological data from Honolulu International Airport; 1992 Met data was not used because there were a lot of missing data and thus, did not meet EPA criteria for a valid data set. The "special grid" option (corners method, fenceline grid) of the ISCST3 was selected to generate the receptor locations with 30-m spacing. Per Jim Morrow, consultant, the facility is a secured area with fences so there is no public access; as such, receptors are placed outside of fence-line hence use of fence-line grid in modeling. The consultant ran the model with "urban" for land use option since greater than 50% of the surrounding land use are industrial, commercial or high density residential (40 CFR, Appendix W, paragraph 8.2.3). For the Sand Island area, "flat" terrain was considered (e.g., no elevated terrain option selected). Input/Output files of the modeling are on diskette.

Emission rates for short-term and long-term are shown in Tables 18 and 19, respectively. For the diesel engine generator, $NO_2$, CO, VOC and $PM_{10}$ emission rates are obtained form manufacturer's specifications; $SO_2$ emission rate is derived from AP-42 emission factor. The drum-mix and hot oil heater emission rates are also obtained from AP-42 emission factors.

Stack parameters are shown in Table 20. The modeling dictates the design of the emission sources' stack heights. By adjusting the stack height parameter in the modeling, the consultant determined the "best" heights for each stack with the other given parameters to meet the state ambient air quality standards (SAAQS).

For modeling downwash, ISCST3 requires the critical height and width of the buildings/structures for each $10^{o}$ flow vector. The Building Profile Input Program (BPIP) of the BEEST program was used to determine which buildings/structures cause downwash (wake effects of the interaction between plume and building). The modeling accounted for 26 buildings/structures.

Modeling results with comparison to SAAQS is shown in Table 21. Background concentrations were obtained from the Annual Summary Air Quality Data 2002. The results demonstrate compliance with SAAQS.

**PROPOSED**

### Table 21 - Short-Term Emission Rates (g/s)

| Unit | $PM_{10}$ | CO | $SO_2$ |
|---|---|---|---|
| Diesel Engine | [a]0.03 | 0.12 | [b]0.47 |
| Hot Oil Heater | 0.0027 | 0.0126 | 0.1789 |
| Drum Mix | 0.87 | 4.91 | [c]2.19, [d]0.42 |

[a] (0.10 g/hp-hr) x (1,085 bhp) x (1 hr/3,600 sec) = 0.03 g/s

[b] (0.505 lb/MMBtu) x (0.14 MMBtu/gal) x (53 gal/hr) x ( 1 g/2.205 E-03 lb) x (1 hr/3,600 sec) = 0.47

[c] Spec used oil

[d] fuel oil no. 2

### Table 22 - [a]Long-Term Emission Rates (g/s)

| Unit | [b]$NO_x$ (as $NO_2$) | $PM_{10}$ | $SO_2$ |
|---|---|---|---|
| Diesel Engine | [c]0.488 | 0.010 | 0.162 |
| Hot-Oil Heater | 0.013 | 0.001 | 0.061 |
| Drum-Mix | 0.534 | 0.298 | [d]0.751, [e]0.142 |

[a] Based on annual limit of 3,000 hr/yr.

[b] To meet $NO_x$ SAAQS, $NO_x$ is converted to $NO_2$ with EPA Tier 1 default value 0.75 of $NO_x$.

[c] (22.61 ton/yr) x (2,000 lb/ton) x (yr / 8,760 hr) x (hr / 3,600 sec) x (g / 2.295 E-03 lbs) x (0.75) = 0.488 g/s

[d] Spec used oil

[e] F.O. #2

### Table 23 - Stack Parameters

| Unit | stack height (m) | stack dia. (m) | stack velocity (m/s) | stack temp. (K) |
|---|---|---|---|---|
| Diesel Engine | 6.55 | [a]0.254 | 55.65 | 760.93 |
| [b]Hot Oil Heater | 5.49 | 0.273 | 6.97 | 449.82 |
| Drum Mix | 12.65 | 1.425 | 15.89 | 422.04 |

[a] No data given by manufacturer. The stack diameter is calculated as follows:

exhaust velocity = stack flow rate / area of stack, where area of stack = pi * $(d/2)^2$

Generally, an exhaust velocity of approximately 15,000 ft/min is the maximum threshold to avoid back pressure, which can stall the engine (from a diesel engine manufacturer, per Jim Morrow).

So, d = sqrt [(stack flow rate / exhaust velocity) x (4/ pi)]

= sqrt [ ( (5,975 $ft^3$ / min) / (15,000 ft / min) ) x (4 / 3.1416) ] = 0.7122 ft = 8.55 in.

For added margin of safety, the diameter is increased to 10 in. = 0.254 m

[b] None listed in application. Stack parameters were submitted in a previous application (0464-01-CT) for the same CEI-2000. model

**PROPOSED**

## Table 24 - Modeling Results

| Pollutant | Averaging Period | Concentration ($ug/m^3$) | [a]Background ($ug/m^3$) | Total ($ug/m^3$) | SAAQS ($ug/m^3$) | Percent of SAAQS (%) |
|---|---|---|---|---|---|---|
| $SO_2$ | 3-hr | 450 | 30 | 480 | 1,300 | 36.9 |
| | 24-hr | 237 | 9 | 246 | 365 | 67.4 |
| | Annual | 30.3 | 3 | 33.3 | 80 | 41.6 |
| $NO_2$ | Annual | 58.4 | 10 | 68.4 | 70 | 97.7 |
| $PM_{10}$ | 24-hr | 80.8 | 90 | [b]170.8 | 150 | Compliance per 40 CFR 50, Appendix K |
| | Annual | 3.6 | 15 | 18.6 | 50 | 37.2 |
| CO | 1-hr | 676 | 3,990 | 4,666 | 10,000 | 46.7 |
| | 8-hr | 1,120 | 1,582 | 2,702 | 5,000 | 54.0 |

[a] 2002 Annual Summary Hawaii Air Quality Data: Kapolei monitoring station for $NO_2$, Honolulu monitoring station for $SO_2$, $PM_{10}$, and CO

[b] Although the modeled concentration shows an exceedance, 40 CFR 50 Appendix K allows for a provision to demonstrate compliance based on actual monitored quarterly data for background concentrations. The 24-hour standard computation is a procedure to estimate the number of exceedances per year based on quarterly data for the last three calendar years. If the computations indicate the estimated number of exceedances per year is equal to or less than 1.0, compliance is demonstrated:

$e_q = v_q \times N_q / n_q$

where $e_q$ = the estimated no. of exceedances for calendar quarter q
$v_q$ = the observed no. of exceedances for calendar quarter q
$N_q$ = the no. of days in calendar quarter q
$n_q$ = the no. of days in calendar quarter with $PM_{10}$ data
q = the index for calendar quarter, q = 1, 2, 3, or 4
e = the estimated number of exceedances for a single year

$$e = (\text{Sigma})_{q=1}^{4} e_q$$

$PM_{10}$ modeled 24-hr conc. = 80.8 $ug/m^3$
SAAQS standard = 150 $ug/m^3$
background concentrations > 69.2 $ug/m^3$ is the projected exceedanced threshold.

For 2000: [ (1 x 91/91) + 0 + 0 + 0 ] = 1
2001: [ 0 + 0 + 0 + 0 ] = 0
2002: [ (1 x 91/91) + 0 + 0 + 0 ] = 1

So, average e = (1 + 0 + 1) / 3 = 0.667
< = 1.0 (Compliance demonstrated)

**PROPOSED**

**Significant Permit Conditions:**

1. Special Condition No. C.1: Annual fuel consumption limitations were proposed for the drum mix, diesel engine and hot oil heater to meet the $NO_2$ annual SAAQS.
2. Special Condition No. C.5: The particulate matter emission limit of 0.04 gr/dscf is required under NSPS Subpart I.
3. Special Condition No. C.6: The opacity limits for crushing (15% opacity) and transfer points (10% opacity) are required under NSPS Subpart OOO.

**Other Issues/Conditions:**

1. The Reclaimed Asphalt Paving (RAP) bin has rollers for aggregate sizing. In effect, the rollers perform a "crushing" type operation to reduce the size of nonmetallic minerals embedded in RAP and therefore NSPS Subpart OOO would be applicable (crush stone plants capacity > 150 TPH and construction after August 31, 1983)
2. Applicant does not have serial nos. for the equipment to be operated. The serial nos. will be submitted when the facility is in place or available prior to final permit issuance.
3. Amount of asphalt and RAP is required to be submitted "annually" instead of "12-month rolling basis." There is no production limitation and thus, the 12-monthly rolling monitoring of asphalt/RAP production is not necessary. The annual requirement is for in-house records for annual emissions and not CERR.
4. No RAP used or asphalt concrete production limit is included in the permit since their operation is already limited by the diesel engine generator, which powers these operations. Adding a tonnage limit would be redundant. Note that the fuel restriction on the diesel engine generator can be equivalent to limiting operation to 3,000 hours/yr, which emission calculations for RAP and asphalt concrete is based on.
5. Background $PM_{10}$ 24-hr concentration added to the modeled concentration showed in exceedance. However, compliance was demonstrated by use of 40 CFR 50, Appendix K instead of limiting the hours of operation on a daily basis (i.e., air quality modeling allows for selecting the hours of operation during a day under *Source Option - Factors - HROFDY*).

**Conclusion and Recommendation:**

Applicant has demonstrated compliance with SAAQS. Measures will be taken to control fugitive dust from paved roads and storage piles with the use of a water truck. Conditions are stipulated in the permit to meet applicable state (Hawaii Administrative Rules) and federal regulations (BACT, NSPS, etc.). As such, issuance of the initial covered source permit is recommended following public comments and EPA review.

Reviewer: Carl Ibaan
Date: December 22, 2003